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Low Levels Of Vitamin D Raise Type 1 Diabetes Risk

admin | December 13, 2012 | [Comments \(0\)](#)



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In Real Diabetes Truth on 26 January 2012, I wrote about the [dangers of vitamin D deficiency](#) and how important this vitamin is for people with diabetes. Low levels of vitamin D have been firmly linked with the development of insulin resistance and type 2 diabetes. I am writing again about this vital issue in the light of new research on the role vitamin D plays in the development of type 1 diabetes and following recent news reports of an “epidemic” of vitamin D deficiency in the UK.

Vitamin D is often called “the sunshine vitamin” because it is mainly made in our skin in response to strong sunshine. We obtain only 10 per cent or less of our vitamin D requirement from food. So, with the sun being a rare visitor to our shores this summer, many of us are going short on this essential substance. The exceptionally dull summer this year will only make worse the bad situation that I described last January and we can expect illnesses linked to vitamin D deficiency to increase. As well as diabetes, these include cancers, heart disease, autoimmune conditions, rickets, osteomalacia, multiple sclerosis and depression.

In my earlier post, I mentioned a Finnish study that had found a link between vitamin D intake during the first year of life and the subsequent development of type 1 diabetes. Now, researchers at the University of California, San Diego School of Medicine have established a correlation between people’s blood levels of vitamin D and the subsequent incidence of type 1 diabetes. So, for the first time, getting a blood test for vitamin D could give an accurate indication of the risk of this condition and how much your blood level might need to be raised to prevent it.

It will probably be some time before your GP is given any sensible guidance on this issue, or is even made aware of the importance of vitamin D deficiency as a risk factor for type 1 diabetes. However, it still pays to ask for a blood test to find out what your vitamin D level is. The optimal amount is around 75 to 80 nmol/l and if your level is below 50 nmol/l you will need to start taking a supplement (or increase your dose if you are already taking one).

In the meantime, scientists are gaining a better understanding of how vitamin D works to prevent type 1 diabetes. Vitamin D is not like other vitamins because it is actually a hormone (of a type called secosteroids) and is becoming increasingly recognised as orchestrating the growth and differentiation of a variety of tissues and cells, including those of the immune system. Sufficient levels of vitamin D are needed for the production of regulatory T-cells, which instruct the immune system not to attack the insulin-producing cells in the pancreas.

Why your vitamin D level is the most important risk factor for heart disease

As well as protecting against the development of type 1 diabetes, vitamin D can help to prevent many of the complications that people with diabetes face. One of the most serious and life-threatening of these is the cardiovascular disease that results from arteries becoming clogged up. Now, scientists have discovered how, without sufficient vitamin D, immune cells called macrophages bind to blood vessels near the heart and then trap cholesterol to block those blood vessels.

Crucially, the researchers found that having high blood pressure, being overweight, or having high cholesterol or blood sugar levels made little difference to this process. Only vitamin D levels determined whether those cells stuck to the blood vessel walls or not. This means that doing all the right things to make sure your other risk factors are reduced as far as possible may not help much if your vitamin D level is low.

What I said back in January is now more urgent than ever – taking a vitamin D supplement is advisable for

everybody in the UK and, for people with diabetes, it is an essential part of managing the condition and avoiding dangerous complications. Back then, I recommended taking 2000 IU (50µg) a day of vitamin D3, also known as cholecalciferol or calcitriol. But just this year more evidence has accumulated for the benefits of higher doses of vitamin D and for its safety when taken at these doses.

The authors of the study on vitamin D's role in preventing type 1 diabetes consider that most people would need to take 4000 IU (100µg) a day of vitamin D3 in order to achieve high enough blood levels to reduce their risk of the disease. Given the wide range of functions that vitamin D has in the body, that now seems to be a realistic dose for general good health. Unfortunately, government advice is lagging behind and still only advocates getting one tenth of this amount, 400 IU a day.

Should the sun decide to show its face next summer, try to get 20 minutes of skin exposure a day, without sunscreen, over the maximum body area you can (without getting arrested!). Eating oily fish is the best way to get extra vitamin D in your diet but it is impossible to get enough from diet alone and sun exposure, along with supplementation, remains essential.

While I have mentioned cardiovascular disease as one common complication of diabetes, several others are well known, such as nerve, eye and kidney problems. Recently, though, it has been found that diabetes may also be a factor in both hearing loss and infertility and I shall be telling you about the results of this new research in my next blog post.

Wishing you the best of health,

Martin Hum
PhD DHD Nutritionist
for Real Diabetes Truth



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